



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,942	08/30/2002	Shawn X. Du	GLOZ 2 00116/GD-50	3629
27885	7590	10/20/2004	EXAMINER	
FAY, SHARPE, FAGAN, MINNICH & MCKEE, LLP 1100 SUPERIOR AVENUE, SEVENTH FLOOR CLEVELAND, OH 44114			ALAVI, ALI	
			ART UNIT	PAPER NUMBER
			2875	

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/064,942

Applicant(s)

DU ET AL.

Examiner

Ali Alavi

Art Unit

2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 26 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13,14 and 35-42 is/are allowed.
- 6) ☒ Claim(s) 1-6,11,12,17-22 and 24-34 is/are rejected.
- 7) ☒ Claim(s) 7-10,15,16 and 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>7/22/04</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

1. Applicant's amendment filed on July 26, 2004 has been entered. Accordingly, claims 13, 17, and 35 have been amended. Claims 1-42 are still pending in this application.
2. Applicant's arguments with respect to claims 1-42 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6, 11-12, 17-22, 24, and 25 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Stopa et al (US Pat. No 6,641,284).

Regarding claim 1, Stopa discloses a light source comprising: a light emitting semiconductor device (100, fig. 3), and a support substrate having a generally reflective planar surface (PC board 40 has a copper cladding which inherently reflective, fig. 1) that supports the semiconductor device, the light emitting semiconductor device heat sinking (50, fig. 1) via the support substrate (40), and a curved reflector having a concave parabolic reflective surface (10, fig. 1), the light emitting semiconductor device arranged between the generally planar reflective surface and the concave parabolic

Art Unit: 2875

reflective surface, the support substrate and the curved reflector together defining a light aperture (12, fig. 3) through which light produced by the light emitting semiconductor device passes.

Regarding claim 2, Stopa discloses the claimed invention as applied above in claim 1 and further discloses that the planar surface and the concave parabolic reflective surface cooperate to reflect light produced by the light emitting semiconductor device that is directed toward one of the planar reflective surface and the concave parabolic reflective surface toward the light aperture along a direction generally parallel to an optical axis of the concave generally parabolic surface (fig. 7).

Regarding claim 3, Stopa discloses the claimed invention as applied above in claim 1 and further discloses that an optical axis of the concave generally parabolic surface coincides with the planar reflective surface (fig. 7, col. 6, line 53).

Regarding claim 4, Stopa discloses the claimed invention as applied above in claim 1 and further discloses that the light emitting semiconductor device is centered at an optical focus of the concave generally parabolic surface (figs. 1-7).

Regarding claim 5, Stopa discloses the claimed invention as applied above in claim 1 and further discloses that the light emitting semiconductor device is positioned with a first edge substantially aligned with an optical focus of the concave generally parabolic surface, the light emitting semiconductor device extending from the first edge away from the light aperture (figs. 1&3).

Regarding claim 6, Stopa discloses the claimed invention as applied above in claim 1 and further discloses that the light emitting semiconductor device is positioned

with a first edge substantially aligned with an optical focus of the concave generally parabolic surface, the light emitting semiconductor device extending from the first edge away from the optical focus along an optical axis of the concave generally parabolic surface (fig. 3).

Regarding claim 11, Stopa discloses the claimed invention as applied above in claim 1 and further discloses that the light emitting semiconductor device is a light emitting diode having a direction of strongest light emission directed perpendicularly to the generally planar reflective surface and away therefrom (fig. 7).

Regarding claims 12, Stopa discloses the claimed invention as applied above in claim 1 and further discloses that the light emitting semiconductor device and the curved reflector define a light emission module, the light source including a plurality of light emitting modules arranged on the support substrate (42, fig. 1).

Regarding claim 17 Stopa discloses a headlight for a vehicle (intended use), the headlight comprising: a support surface (40, fig. 1), and a plurality of light emission modules (42, fig. 1) each including a reflective cup (fig. 9A) including a planar portion and a parabolic portion joined together at a parabolic interface (fig 9A), an open end of the parabolic portion defining a light output opening (12), and a light emitting semiconductor die (46) attached to the planar portion of the reflective cup (col.5,line 46) and oriented to produce light directed toward the parabolic portion of the reflective cup, wherein the light emission modules are arranged on the support surface with the planar portion of each reflective cup parallel to the support surface and the light output

openings of the reflective cups arranged such that the plurality of light emission modules produce a cumulative light beam (fig. 7).

Regarding claim 18, Stopa discloses the claimed invention as applied above in claim 17 and further discloses that light emission module further includes: a light-transmissive material (silicon gel 47, col. 5, line 46) that fills the reflective cup and seals the light emitting semiconductor die (col. 5, lines 43-55).

Regarding claim 19, Stopa discloses the claimed invention as applied above in claim 17 and further discloses that the parabolic portion of the reflective cup includes a reflective film disposed on the light-transmissive material (fig. 9A).

Regarding claims 20-22, 24 and 25 Stopa discloses the claimed invention as applied above in claim 17 and further discloses that the plurality of light emission modules include: low beam light emission modules that produce light directed at a low beam angle relative to a parabolic axis of the parabolic interface; and high beam light emission modules that produce light directed at a high beam angle relative to the parabolic axis of the parabolic interface, the high beam angle being smaller than the low beam angle (col. 6, lines 40-60).

4. Claims 26-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Okazaki (EP 10125959).

Regarding claim 26, Okazaki discloses a solid-state light emitting device, and a reflector including a generally planar side (40, fig. not numbered) and a generally concave curved side (43) facing the generally planar side, the solid-state light emitting

device supported by the generally planar side and emitting light generally directed toward the concave curved side, the reflector further including an opening defined by edges of the generally planar side and the generally concave curved side toward which the generally planar side and the generally concave curved side cooperatively direct light produced by the solid-state light emitting device.

Regarding claim 27, Okazaki discloses the claimed invention as applied above in claim and further discloses and further including: a translucent or transparent (10, fig. 2) filling material filling the reflector and having an light-transmissive surface disposed at the reflector opening (transmitting body 42, abstract).

Regarding claim 28, Okazaki discloses the claimed invention as applied above in claim 26 and further discloses that the light-transmissive surface defines a lens for focusing the light (fig. 1).

Regarding claim 29, Okazaki discloses the claimed invention as applied above in claim 27 and further discloses that the light-transmissive surface is arranged at a non-perpendicular angle to the generally planar side to refractively tilt the light.

Regarding claim 30, Okazaki discloses the claimed invention as applied above in claim 26 and further discloses that the generally concave curved side defines a half-parabolic reflector (fig.).

Regarding claim 31, Okazaki discloses the claimed invention as applied above in claim 30 and further discloses that a parabolic axis of the half-parabolic reflector lies on or near the generally planar side (fig.).

Regarding claim 33, Okazaki discloses the claimed invention as applied above in claim 26 and further discloses that the generally planar side and the generally concave curved side cooperatively direct light produced by the solid-state light emitting device parallel to the generally planar side (fig.).

Regarding claim 34, Okazaki discloses the claimed invention as applied above in claim 26 and further discloses that the generally planar side of the reflector provides primary heat sinking for the solid-state light emitting device (fig.).

#### ***Allowable Subject Matter***

5. Claims 7-10, 15-16, 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 7 is objected to because in part recites "... Wherein the curve reflector includes: a light transmissive encapsulant that encapsulates the light emitting semiconductor device and at least a portion of the generally planar reflective surface, the encapsulant including a convex generally parabolic encapsulant surface, and a reflective layer disposed on the convex generally parabolic encapsulant surface, an interface between the reflective layer and the encapsulant corresponding to the concave generally parabolic surface of the curved reflector." This limitation in combination with limitation of claim 1 was not shown or taught in the prior art of record. Claims 8-10 are objected because they are either directly or indirectly depended on claim 7.

Claim 15 is objected to because in part recites "... wherein the light



emitting semiconductor device includes a monolithic array of light emitting semiconductor device elements, the support substrate includes the monolithic substrate, and the curved reflector includes a plurality of curved reflectors corresponding to the light emitting semiconductor device array elements, the light source further including: a plurality of encapsulant forms corresponding to the light emitting semiconductor device array elements, each encapsulant form encapsulating the corresponding light emitting semiconductor device array element and including a curved surface defining a curvature of the curved reflector." This limitation in combination with the limitation of claim 1 was not taught in the prior art of record. Claim 16 is objected to because it depends on claim 15.

6. Claims 13-14, 35-42 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claims 13-14, reasons for allowance was given in the prior action which was mailed on 4/22/04. Regarding claims 35-42, the prior art of record failed to teach or suggest a method of manufacturing including an applying an encapsulant over the light emitting semiconductor die to seal the die and applying a reflective layer to the curved side of the encapsulant.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

**Conclusion**

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Marshall et al (US Pat. No 6,547,423) discloses LED module including an encapsulant lens with a parabolic reflective out layer wall.
8. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Ali Alavi whose telephone number is (571) 272-2365. The examiner can normally be reached between 7:00 A.M. to 5:30 P.M. Tuesday to Friday. If attempts to reach the examiner by phone are unsuccessful, the examiner's supervisor, Sandy O'Shea can be reached at (571) 272-2378 or you may fax your inquiry to the **Central Fax at (703) 872-9306**.

Ali Alavi



Patent Examiner

AU 2875